What is Special about Special Waste

Special Wastes

- Waste from a business that requires additional or specific handling for proper disposal;
- Garbage, refuse, or other discarded material or waste, including solid and semi-solid materials that require a special administrative assessment, additional processing, special transportation, special packaging, and/or additional disposal techniques due to the quantity of material generated and/or its unique physical, chemical, or biological characteristics.
- Examples of common special wastes include petroleum-contaminated soil, asbestos, stabilized grit & bar screenings, absorbent booms, and pads, liquids, pit sludge, baghouse dusts, dried paint filters, biosolids, grease/scum waste, or any other hard-to-handle material that is not considered hazardous.

Special Wastes

- Nonresidential or commercial solid wastes, other than regulated hazardous wastes, that are either difficult or dangerous to handle and require unusual management at municipal solid waste landfills, including, but not limited to:
- (1) Pesticide wastes;
- (2) Liquid wastes and bulk liquid wastes;
- (3) Sludges;
- (4) Industrial process wastes, defined as wastes generated as a direct or indirect result of the manufacture of a product or the performance of a service, including, but not limited to, spent pickling liquors, cutting oils, chemical catalysts, distillation bottoms, etching acids, equipment cleanings, point sludges, core sands, metallic dust sweepings, asbestos dust, and off-specification, contaminated, or recalled wholesale or retail products. Specifically excluded are uncontaminated packaging materials, uncontaminated machinery components, landscape waste, and construction or demolition debris;

Special Wastes

- (5) Wastes from a pollution control process;
- (6) Residue or debris from the cleanup of a spill or release of chemical substances, commercial products, or wastes listed in items (1) through (5);
- (7) Soil, water, residue, debris, or articles that are contaminated from the cleanup of a facility or site formerly used for the generation, storage, treatment, recycling, reclamation, or disposal of wastes listed in items (1) through (6); and
- (8) Containers and drums.

Categories of special waste

- **Commercial/Industrial Waste**: This is non-hazardous industrial process waste, treated infectious waste and similar potentially harmful waste that requires special handling. Examples include: processed sludge, ash, filters, sandblast media and dusty wastes. Commercial/industrial waste must not contain "free" liquids and must be containerized if it can become airborne.
- **Liquid/Semi-solid waste**: These wastes are mixed with absorbent materials to allow for beneficial use and proper disposal in the landfill. Examples include industrial liquids, cooling fluids, cutting oils, rinse water, latex paints and inks, food production waste, municipal waste, tank bottoms/sludges, and drilling waste.
- **Petroleum Contaminated Soils**: These soils are non-hazardous and contaminated with petroleum products. This type of waste is treated by aeration and then used as a daily cover at the Landfill.
- **Other Special Waste**: These need special handling, such as spill cleanup materials, off-spec products, animal carcasses, drums and pressurized containers, fluorescent lights, and asbestos.

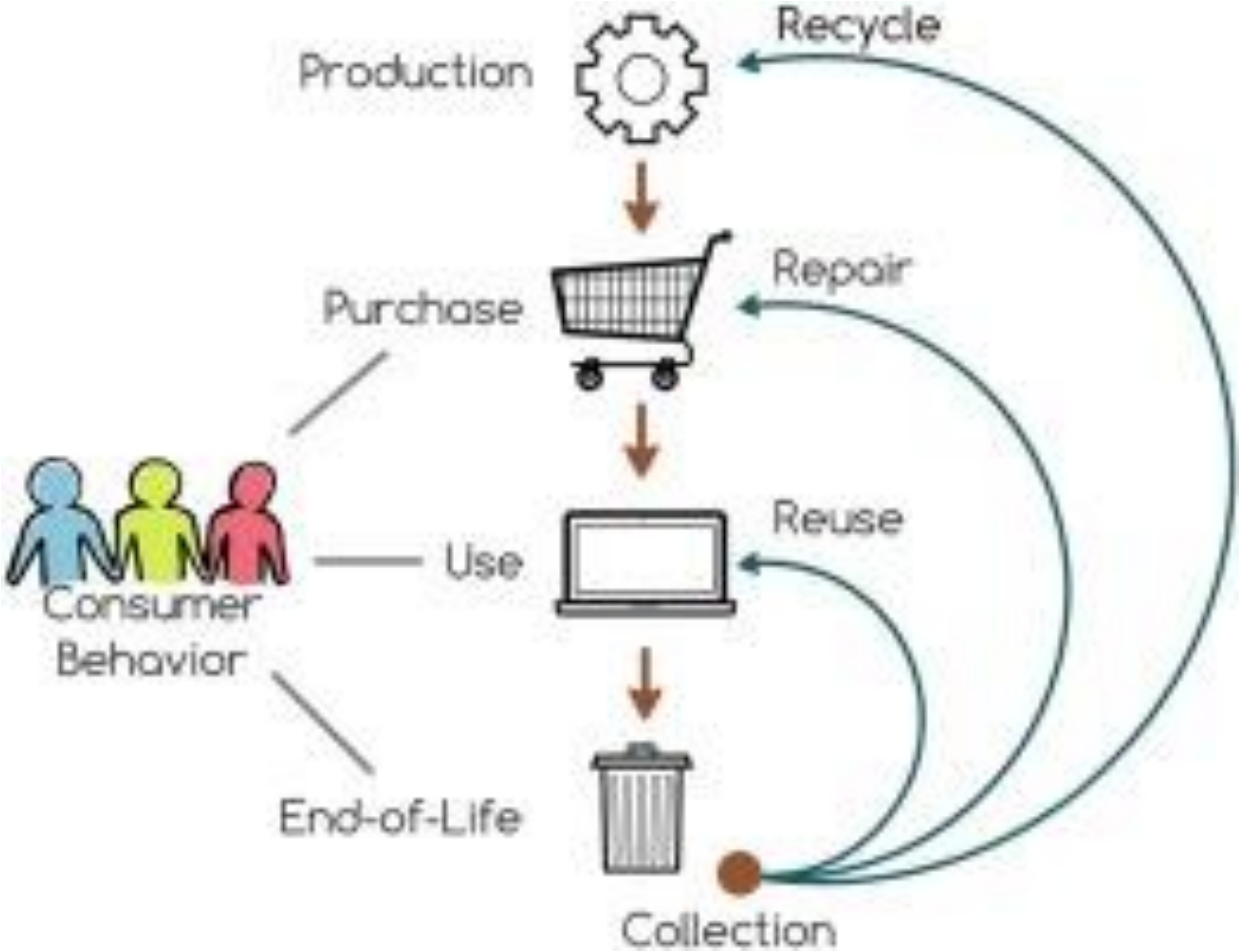
Characterization and Management

- Require special or extraordinary handling conditions due to the characteristics of the wastes or additional regulatory controls on the management of the wastes.
- Certified knowledge of the process by which the waste stream was generated
- Analytical test data/Profiling
- Application for permits
- Permits
- Waste Tracking
- Certified Disposal

Management of Special Waste

- Animal Wastes: Dead Animal, Caracass, Poultry Litter
- Automotive Waste: Tire, Used Oil, Lead Acid Battery
- Construction and Demolition Waste: Debris, wood, Fluorescent Lamp, Paints
- Waste water/Sewage/sludges, Containers

E-Waste


Production
Recycle
Purchase
Repair
Consumer Behavior
Use
Reuse
End-of-Life
Collection

E-Waste

- The electronic industry is the world’s largest and fastest growing manufacturing industry.
- Rapid product obsolescence and technological advances are a new environmental challenge
- Socio-economic development and technological advancement are the main drivers of increasing trend of E-waste.
- Latest cellular phones, laptops, air conditioners and consumer electronics.
- Problem in Management, Inadequate legislation, difficulty in inventory, health hazards due to informal recycling, poor awareness and reluctance on part of the corporate to address the critical issues.
- When economically valuable materials are dumped resources are wasted

E-Waste

- Electronic waste, e-waste, e-scrap, or Waste Electrical and Electronic Equipment (WEEE) describes discarded electrical or electronic devices.
- Discarded computers, office electronic equipment, Entertainment device electronics, mobile phones, television sets and refrigerators which are made of sophisticated blends of plastics, metals, and other materials.
- Used electronics which are destined for reuse, resale, salvage, recycling and disposal.
- According to Gui et al (2003),”WEEE is diverse and complex in terms of materials and components as well as the manufacturing process. Characterization of this waste stream is of paramount importance for developing a cost effective and environmental friendly recycling system”.
- The European WEEE Directive classifies waste in ten categories:

(1) Large household appliances (including cooling and freezing appliances)
(2) IT equipment including monitors
(3) Lamps and Luminaires
(4)Tools
(5) Automatic dispensers
(6) Small household appliances
(7)Consumer electronics (including TVs)
(8)Toys
(9)Medical devices
(10)Monitoring and control instruments

E-Waste

- The Partnership on Measuring ICT for Development defines e-waste into six (6) categories, namely :
  - (1)Temperature exchange equipment (e.g., air conditioners, freezers),
  - (2)Screens, monitors (e.g., TV, laptop),
  - (3)Lamps(e.g., LED lamps),
  - (4)Large equipment (e.g., washing machines, electric stoves),
  - (5)Small equipment (e.g., microwave, electric shaver), and
  - (6)Small IT and telecommunication equipment (e.g., mobile phones, printers).
- Products in each category vary in longevity profile, impact, and collection methods, among other differences

E-Waste-Constituents

- E-waste constitutes heavy metals, persistent organic pollutants, flame retardants and other potentially hazardous substances.
- Large and small household appliances, electrical and electronic toys and sporting equipment, tools, computers and related equipment etc. contains metallic and non metallic elements, alloys and compounds such as Cu, Al, Au, Ag, Palladium, Platinum, Ni, Tin, Pb, Fe, S, P, As etc. The fraction includes over 60% of metals, while plastics account for about 30% and the hazardous pollutants comprise only about 2.70%.

E-Waste-Constituents

- During recycling and material recovery three main groups of substances are released into the environment which needs high priority attention as they are highly hazardous in nature.
- **The first group** is the original constituents of equipment such as Pb and Hg. Improper breaking or burning of printed circuit boards and switches may lead to the release of Hg, Cd and Be. About 70% of the heavy metals especially Hg & Cd, in landfills come from electronic waste.
- **Second group** such as cyanide, added during some recovery processes
- **Third group** which are formed during recycling processes such as dioxins and furans. recycling of components containing hazardous compounds such as halogenated chlorides and bromides used as flame-retardants in plastic, which form persistent dioxins and furans on combustion at low temperatures.

E-Waste Generation

- 44.7 million tonnes generated in 2016
- In 2019, the world generated **53.6 million metric tons (Mt)**, and only 17.4% of this was officially documented as properly collected and recycled.
- Most importantly, official data for the transboundary movement of e-waste are unknown. Most of the e-waste (i.e 16 Mt) was generated in Asia.

Management of E-Waste (4 –steps)

- ***A. Composition and Recycle Potential:*** Materials found in e-waste may be divided broadly into six categories as follows:
  - ☐ Iron and steel, used for casings and frames
  - ☐ Non-ferrous metals, especially Cu used in cables, and Al
  - ☐ Glass used for screens, windows
  - ☐ Plastic used as casing, in cables and for circuit boards
  - ☐ Electronic components
  - ☐ Others (rubber, wood, ceramic etc.).

Management of E-Waste

- ***B. Methodologies:*** Approach and methodology to determine the hazardousness

❑ Step 1: Identification of E-waste category

❑ Step 2: Identification of E-waste composition

❑ Step 3: Identification of possible hazardous content

❑ Step 4: Identifying whether the E-waste component is hazardous or the entire E-waste item is hazardous.

Management of E-Waste

- ***C. Recycling, Reuse and Recovery***
- *1) Dismantling*
- *2) Segregation of ferrous metal, non-ferrous metal and plastic*
- *3) Refurbishment and reuse*
- *4) Recycling/recovery of valuable materials:* Ferrous metals in electrical furnaces, non-ferrous metals in smelting plants, precious metals in separating works.
- *5) Treatment/disposal of dangerous materials and waste*

Management of E-Waste

- ***D. TREATMENT & DISPOSAL***

- land filling and incineration

E-WASTE MANAGEMENT STRATEGIES

- *A. Policy level initiatives*
- *B. Extended producer responsibility:* take-back and management services for their products at the end of life of those products
- *C. Training and awareness programmes*